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FUNGI OF NORTHERN BRAZIL

Rolf Singer

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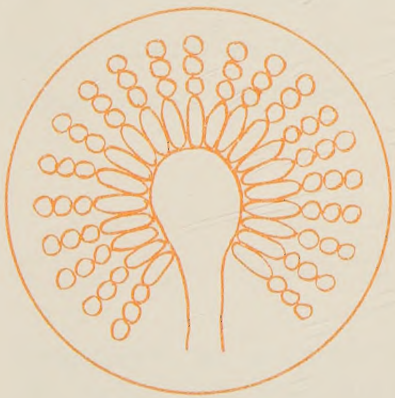

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FUNGI OF NORTHERN BRAZIL

Rolf Singer

During the month of July 1960, the author had the invaluable opportunity of studying in the field and laboratory the fungi flora of Pernambuco and Paraiba, thanks to a grante from the National Science Foundation, Washington D.C., U.S.A., and the kind invitation of the Universidade do Recife [1]. Below, we shall start with some data on new and interesting fungi collected at this occa-

1) It is a pleasure to acknowledge my gratefulness to both the National Science Foundation and to the Rector Magnificus of the Universidade do Recife. It gives me great satisfaction to thank the Director of the

sion It is planned to publish further contributions towards the knowledge of the fungi flora of North Brazil, especially the Agaricales, in continuation of the present article, and arrive at some general conclusions on the floristic, phytogeographic, and ecological aspects suggested by the material in my possession.

PHYCOMYCETES

Endogone lignicola Pat.

When fresh, the carpophores are about 11 mm broad and 6 mm high or smaller, whitish on the outside, and the sporiferous internal layer pale cinnamon brown. It has the large spores and the habitat on wood characteristic for this species whose type (FH) we have compared.

Instituto de Micologia of that University, Dr. A. Chaves Batista for the innumerable courtesies and the help with advice as well as with the resources of his Institute. If it had not been for him, it would have been impossible to obtain such a complete knowledge of such a large percentage of the mycoflora of the region.

On wood of Dicotyledoneous trees in tropical forest, Dois Irmãos, Pernambuco, 13. VII.1960, R.Singer nº B3386 (LIL)

APHYLLOPHORALES

Stereaceae Bond. & Sing. [1])

Sov. Bot. 1943, p.31 ex Sing.: Subtribu Coriolinis Imazeki (Bull. Tokyo Sc. Mus. 6: 78, 1943) analoga familia at hymenophoro destituta et forma fructificationum atque variatione cellularum cystidiformium in hymenio amplius evadit, sporisque interdum amyloideis. Typus: Stereum Pers. ex S.F. Gray. Genera cetera: Laxitextum Lentz, Amylostereum Boidin, Cymatoderma Jungh., Caripia O.K., Skepperia Berk., plurima genera e divisione Sterei sensu lato orta, probabiliter nonnulla genera "cyphellacea".

Caripia montagnei (Berk.)O.K.

This species, often mistakenly regarded as an agaric, but undoubtedly stereaceous (cf. Singer, Lilloa 22:730,1951)is very common in Pernambuco and Paraiba. However, towards the south it becomes more scattered in

occurrence and has never been found in Argentina or Uruguay or Chile. Our collection from Dois Irmãos, Pern., Singer B 3078 (LIL)

CORIOLACEAE Sing.[2])

[2]) fam. nov. Characteribus Coriolinarum (subtribus, Imazeki, l.c.) gaudet Genus typicum: Coriolus Quél.; genera cetera: Pycnoporus Karst.; Cerrena Mich ex Gray; Coriolellus Murr.; Poronidulus Murr.; Trametes Fr.; Pseudotrametes Bond. & Sing. ex Sing.; Haploporus Bond. & Sing. ex Sing.; Hexagona Pollini ex Fr.; Antrodia Karst; Funalia Pat.; Coriolopsis Murr.; Flaviporus Murr.; Irpex Fr.; Hirschiporus Donk; Daedalea Pers. ex Fr.; Deadaleopsis Schröter; Lenzites Fr.; Gloeophyllum Karst.; Xerotus Fr.; Whitfordia Murr. etc.

Microporellus dealbatus (Berk. & Curt.) Murr.

This species is common from the warmer regions of North America through the West Indies, the Guianas, to the Amazonas, and Central Brazil. It is sometimes considered as intermediate between the Polyporaceae s.st (which belong in the Agaricales) and the Coriolus-group (here described as family Corio-

laceae), but this interpretation is erroneous. Microporellus by its texture, zonation and structure differt strongly from Polyporus and comes closest to Coriolus from which, however, it differs in stipitate corpophores and in hyphal configuration. It is perhaps possible to distinguish subfamilies or tribus in the Coriolaceae according to tramal structure (which separates Microporellus from Coriolus and Xerotus from Gloeophyllum) and hyphal pigmentation (which, in turn, separates Microporellus - Hyphae hyaline, no alkali reaction - from Xerotus - Hyphae with membrana pigment, strong dark alkali reaction).

The Brazilian material restudied by me recently includes: Amazonas, Juruá, E. Ule 1900 (LIL, FH) - Dois Irmãos, Pern., R. Singer B 3088 (LIL) - Guajará mirim - Guaporé, Singer nº B 1789 (LIL).

Xerotus erubescens (Berk.)Sing. apud Martin

This species is characteristic and common in Northern South America and in the entire Amazonas Bassin. It is closely related to X.afer Fr. from tropical Africa.

New for Paraiba: João Pessoa, on post, Singer B 3362 (LIL).

CANTHARELLACEAE

Craterellus orinocensis Pat.

This species is poorly known and is therefore redescribed below:

Pileus convex with indundibuliform center, fuliginous-black, floccoseuneven in the center, innately fibrillose otherwise, somewhat radially rugulose, 9-22 mm broad.

Hymenial surface smooth, gray.

Stipe concolorous with pileus, subsmooth to smooth, equal solid, 14-42 x 1,5-4 mm.

Context "polo tan" (Maerz & Paul), thin but cartilagineous-fleshy; taste mild; odor none.

Spores 8-10,3 x 7,5-8,3 u, smooth, thin-walled, nonamyloid, hyaline, short-ellipsoid. Basidia 55-60 x 8-8,5 u, 6-spored, elongate-clavate to cylindric, evidently stichic. Cystidia none seen. Hyphae of the context with numerous clamp connections, some slightly fuliginous, some with slightly thickened wall, inamyloid.

On the ground in forest. Camaragibe - Pern., R. Singer nº B 3118 (LIL)

Since the spore size is now known,

it is possible to compare this species, doubfully put in synonymy with Craterellus cornucopioides var. parvisporus Heinemann by Heinemann (Bull.Jard.Bot. Brux., 28:432, 1958), with that African species. It becomes quite obvious that the two species are not identical with each other.

A somewhat related but multipilous and hirtute species has also been found in Brazil by this author. It seems to be new.

AGARICALES

Polyporaceae

Polyporus dermoporus Pers.

This common species of the American tropics is more generally known as Favolus brasiliensis Fr. and might easily be considered the type of a genus corresponding to Pleurotus in the anatomy of its hymenophore thus differing from the majority of the species of the genus Polyporus such as at present interpreted by Donk, Bondarzew and others. If this favoloid group is separated from Polyporus under the Friesian name Favolus, Polyporus dermoporus, for nomenclatorial

reasons, becomes again Favolus brasiliensis Fr.

The carpophores of the form collected were entirely white, the pores to 3 mm wide; the spore print white on white paper. It grew on dead dicotyledoneous wood: Paraíba, João Pessoa, Singer B 3365 (LIL).

Pleurotus ostreatoroseus Sing. spec. nov.

Omnibus characteribus suis colore excepto cum P. ostreato congruit sed ex albido siccando rosascit. A P. eoo (= Agaricus eous Berk.) sporis maioribus differt. Typus in herbario LIL conservatus est.

Pileus whitish, sometimes with some sordid buff or grayish tinge, becoming pink on drying, surface and shape as well as size as in P. ostreatus.

Lamellae whitish and drying to pink or "Ibis pink" (Maerz & Paul) even when fresh, close or subclose, rather narrow to medium broad, deeply decurrent, not or scarcely anastomosing at base of carpophore. Spore print not obtained.

Stipe lateral and extremely reduced, or mostly absent and pileus late rally attached.

Context white, unchanging or pale pinkish when drred, elastic fleshy as in P. ostreatus, sometimes rather thin as in the majority of the tropical forms of the latter, more rarely rather thick; taste mild; odor agreeable (sometimes like that of Boletus edulis), weak.

Spores 7,5-10,3 x 3-3,8 (4) u, cylindrical, smooth, thin-walled, inamy loid. Basidia 15-20 x 5-5,5 u, 4-spored. Cystidia none. Cheilocystidia in well preserved young material conspicuous, clavate, hyaline, rarely with a mucro or subcapitate, 22-40 x 7-9 u, making the edge heteromorphous, but in older material poorly preserved, scattered and variable in size and shape, often merely some thin hyphal ends and some swollen ventricose bodies observed. Subhymenium well developed. Hymenophoral trama irregular, consisting of elongate hyphae many of which have rather to very thick walls. All hyphae with clamp connections.

On wood of dicotyledonous trees.

Material observed: BRAZIL: Paraiba: João Pessoa, Singer nº B 3313 (LIL) - Pernambuco: Camaragibe, Singer nº B 3407 (LIL, typus) - Mata do São João, Singer nº B 3438

(LIL) - Rio Grande do Sul. Rick (as Paxillus miniatus Rick but not!), (FH) - Campestre, Sehnem nº 8368 (LIL).

This species can easily be confused with P. ostreatus since the dried material if not preserved with great care or after a considerable time loses the pink tinge so characteristic for this species. A form with the lamellae tinged pink ("conch shell" M&P) and then becoming whitish cream was observed in Argentina, near the Brazilian fronteer(General Manuel Belgrano, near San Antonio, Misiones, Singer nº M 1099 (LIL) on Araucaria wood. The species was already mentioned by me in a previous paper (LILLOA 22: 271, 1951) as Pleurotus sp. It seems to be rather common between Rio Grande do Sul and Paraiba.

TRICHOLOMATACEAE

Gerronema subchrysophyllum (Murr.) Sing.

This species is common in the warm regions of America from Florida and Mexico south to the South American subtropics. It is closely related to G. icterinum (Sing.) Sing. The genus Gerronema, as now emended by this author contains most of the tropical ompha-

lioid agarics like Gerronema fibula (Bull. ex Fr.) Sing. comb. nov. (Agaricus fibula Bull. ex Fr. Systl Mycol. 1: 163, 1821) and related species (formerly Marasmiellus sect. Fibulae Sing. and Omphalina, subgen. Romagnesia)

Dois Irmãos, Pernambuco, on rotten dicotyledoneous wood:Singer B 3081 (LIL).

Lactocollybia angiospermarum Sing.

This species is very common in the American subtropics and tropics from Florida to Mexico and south to Northern Argentina. It is also very common in the Amazonas region, Yungas and Northern Brazil.

Dois Irmãos, Pernambuco, on dicot stumps, Singer B 3065 (LIL).

Trogia cantharelloides (Berk.) Sing.

This species is common from Florida to Southern Brazil.

João Pessoa, Paraiba, on rotting dicot wood, Singer B 3358 (LIL).

Marasmiellus nigripes (Schwein.) Sing.

This species, characteristic because of the strongly inequilateral to stellate shape of the spores, is common from the tem-

perate zone of North America through the tropics and south to the temperate belt of South America.

Dois Irmãos, Pernambuco, on dicotyledoneous stick in forest. Singer B 3083 (LIL)

Dictyopanus pusillus (Pers.)Sing.

This species is common from the state of Florida, U.S.A. and Mexico south through the American tropics to the marginal forests of the Paraná and the Argentine province of Catamarca.

Dois Irmãos, Pernambuco, Singer B 3095 (LIL).

Marasmius cladophyllus Berk.

The genus Marasmius has recently been monographed by this author for South America, with special emphasis on the species of Southern Brazil, the Amazonas and Yungas regions, and Argentina (Sydowia, in press). Below, we indicate an additional collection from Northern Brazil:

Camaragibe, Pernambuco, Singer B 3109 (LIL).

The pileus was "kis kilim" (M&P) in the center and "Hispano" to 12-D-11(M&P) out-

side the center when fresh. The fresh lamellae were "mellow mauve", strongly anastomosing, adnate. The basal mycelium was whitish and not abundant, further upwards the stipe was glabrous and chestnut colored.

In spite of the glabrous stipe and the color of the lamellae this seems to be conspecific with the species under consideration.

COPRINACEAE

Psathyrella roystoniae (Earle) Sing.

This species which occurs on palms from Florida south to Northern Argentina, was encountered for the first time in Brazil: Amazonas: Manaus, Singer B 3449 (LIL).

PAXILLACEAE

Paxillus guttatus Sing. spec. nov.

This interesting new species of Paxillus was found several times during the excursions in Pernambuco and Paraiba.

Pileo brunneolo, maculis guttiformibus rotundis insigni; stipite excentrico, brunneo-fibrilloso-squamuloso; tramate lamel-

larum ammoniaci ope viridescente; sporis ellipsoideis, haud pseudoamyloideis, brunneolis, 4,8-5,3 x 3,3-3,7 u; cystidiis nullis. Velo nullo. Ad lignum putridissimum in silva tropicali. Typus in herbario LIL conservatur.

Pileus "cocoa" (M&P) in the center, between "burnished gold" and "samovar" outside the center, dry, finely punctate-fibrillose on margin, with round guttate blotches much like some Clitocybes of the section Eulepista, with smooth acute margin, lobed or not, generally inequal in outline specially in age, convex with the center depressed above the area of stipe attachement, 45 - 70 mm long, 32-70 mm broad.

Lamellae "mindoro" (M&P) near margin of pileus, but for the most part "cork" color, close, decurrent, intermixed, slightly forked near the stipe in most specimens. Spore print "Mindoro", in thick layer "cocoa" (M&P)

Stipe at the extreme apex mostly whitish below brown ("cocoa" but darker than this color sample in Maerz & Paul), punctate-fibrillose-squamu lose, attenuate downwards, at least in the lower half of the stipe, more rarely equal, mostly decidedly eccentric, more rarely subcentral or lateral, solid, 12 -68x

4-17 mm.

Context brownish white, not discolored when bruised, soft fleshy; taste mild, then slightly bitter; odor none.

Spores 4,8-5,3 x 3,3-3,7 u, ellipsoid, smooth, with firm but rather thin wall and not opaque or not strongly so in NH_4OH, not pseudoamyloid (nor amyloid), light brown. Basidia 24-25,5 x 5,3-5,7 u, clavate, hyaline, mostly demonstrably clamped at the base, 4-spored. Cystidia, none. Subhymenium broad, interlaced, irregular and of relatively small elements, pale brownish in NH_4OH. Mediostratum of somewhat interwoven axially oriented hyphae accompanied by a lateral stratum which was curving outward at first but becomes soon strongly interwoven, the trama proper green in NH_4OH. Epicuticular layer in adult specimens appressed, its hypha smooth and repent, 2-5,5 u in diameter. All hyphae with clamp connections. $FeSO_4$ on context and on surface of pileus causing the tissue to turn green. - KOH on context dull cinnamon, on pileus dirty gray. - NH_4OH dull rosy purple on pileus, lamellae, and context.

On very rotten dicotyledoneous stumps in the forest.

Brazil: Pernambuco - Dois Irmãos, 5.VII.1960, R.Singer nº B 3057 (LIL, typus). Camaragibe, 6.VII.1960. R. Singer nº B 3124, (LIL) - Paraiba, João Pessoa, 11.VII.1960. R. Singer, nº B 3378 (LIL).

This species belongs in the section Atrotomentosi Sing. and differs from the species known in that section (P. atrotomentosus (Batsch ex Fr.) Fr. and P. polychrous Sing.) in the guttate pileus and the chemical characters.

STROBILOMYCETACEAE

Porphyrellus festivus Sing. spec. nov.

This interesting new species is at present the only representative of its genus in South America. It is named festivus because of the remarkably large number of bright pigments observed in the carpophore.

Pileo brunneo, fibrilloso-subtessulato. Hymenophoro albido dein colore sporarum gaudente, immutabili tactu. Sporis in massa haud dehydratata brunneis ("oak" M&P) sub microscopio punctatis, fusoideis, dilute melleis, 15-16 x 4,5-5 u. Stipite purpureo-punctate-hirto. Leccinorum modo, mycelio roseo,

intus carne viridi purpureaque gaudente. In silva sub trunco arborum solitario. Specimen typicum in Herbario LIL conservatur.

Pileus brown ("cocoa" to "Mandalay" M&P) fibrillose, soon becoming fibrillose-squamulose, almost tesselate on whitish ground, dry, pulvinate, about 35 mm broad.

Hymenophore tubulose, tubes about 8 mm long, whitish, unchanging, rounded-depressed around the apex of the stipe; pores concolorous with the tubes, in the middle between the margin of the pileus and the attachment to the stipe rather small (3 pores per 2 mm). Spore print "oak", i.e. brown without any olive shade, and tuber, because of partial accumulation of the mature spores eventually reaching a tome near 13-C-5 or deeper brown in older specimens.

Stipe at the extreme apex whitish, below purple ("haematite red" M&P) punctate on whitish ground, the punctation almost as strong as in the genus Leccinum and stipe surface eventually almost scabrous, solid, tapering upwards, 61-x 11 mm when mature; mycelium at base covering a fleshy acuminate outgrowth of the stipe which is hidden in the substratum, pink ("rose Hortensia" M&P), un-

derneath the mycelium the surface of the fleshy outgrowth purple.

Context of pileus white, of base of stipe deep olive (24-C-5, M&P) and in the fleshy outgrowth below purple red ("roan"),in the rest of the stipe green ("Gnaphalium green"M&P) and purple ("mellomauve",M&P) mixed, unchanging on exposure excepting the "roan" colored portion below which becomes "coromandel" on exposure, and the purple portions of the flesh of the stipe which becomes orange (11-E-10, M&P)on bruising; taste mild; odor none.

Spores 14,5-18 x 4,5-5,5 u, fusoid, melleous, finely punctate because of very thin, short cylinders perforating the episporium, immature spores hyaline and smooth, all with suprahilar depression. Basidia 36-40 x 11,5-13,2 u, hyaline, clavate,4-spored, basidioles clavate, about 23-32 x 9-10 u. Cystidia ventricose, 39-63 x 6-14 u, hyaline or more frequently ochraceous to fulvous, attenuate or mucronate above, or ampullaceous with a thin cylindrical apex, Cheilocystidia filamentous to clavate, rarely ventricose, hyaline, rarely colored, like the majority of the cystidia, 23-41 x 4,5-8,5 u. Hymenophoral

trama bilateral of the Boletus-type, consisting of filamentous, mostly hyaline hyphae of about 4-5 u diameter. Covering of pileus (squamules) composed of bunche of ascendant to erect hyphae forming a fragmentary trichodermial palisade. Scabrosities of stipe consisting of multiseptate hyphous elements, 3,5-8,5 u in diameter, some granularly incrusted, some with a melleous pigmentations, terminal elements much like the cheilocystidia with broadly rounded tips, dermatopseudoparaphyses and basidia none. Hyphae withou clamp connections.

On the base of dicotyledoneous trees in tropical forest, solitary.

Dois Irmãos, Pernambuco, Brazil, 13.VII.1960. Leg. R. Singer nº B 3384 (LIL, typus).

This species is related to the North American species Porphyrellus gracilis (Peck) Sing. and its group (section Graciles Sing.) but differs in the pigmentation of the context of the stipe and mycelium and from all species of the section except P. gracilis in the ornamentation of the stipe P. gracilis has broader spores than P. festivus.

Since some species of the Strobilo-

mycetaceae are facultative mycorrhiza formers (perhaps biologically comparable with Paxillus involutus), an analysis of the accompanying tree flora has been made. Within a radius of 10 m. around the carpophores found, the following trees were encountered: Eschweilera ovata (Lecythidaceae), Couepia rufa (Rosaceae), Guettardia angelica (Rubiaceae), and Hymenaea microphylla (Leguminosae). Since only the leguminous trees are known as facultative ectotroph components in cicatrizer populations in the tropics, it would be tempting to suspect Hymenaea as mycorrhizal partner of Porphyrellus festivus. However, in view of the rather featurelless mycelium, no anatomical investigation was attempted with Hymenaea roots, and no synthesis was possible because of the slow growth of the mycelium of Porphyrellus. Nevertheless, the presence of Inocybe, Cortinarius, and Russula in the same type of forest in Pernambuco and Paraiba makes it probable that Porphyrellus festivus participates in ectotroph-dominated cicatrizing populations in the tropical forest in those states.

EXPLANATION OF ILLUSTRATIONS

Fig. 1-3 - Carpophores of *Paxillus guttatus* Sing. (Photo courtesy of the Instituto de Micologia, Recife), nat. size.

Fig. 4-5 - Carpophore of *Porphyrellus festivus* Sing. (longitudinal section).

Spores, basidia, cystidia and cheilocystidia (ch) of *Porphyrellus festivus* Sing.

Fig. 1

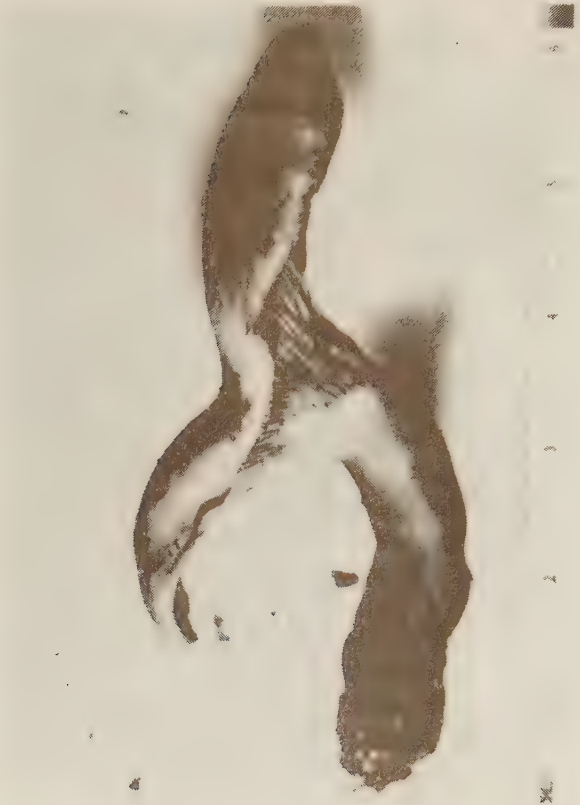

Fig. 2

Fig. 3

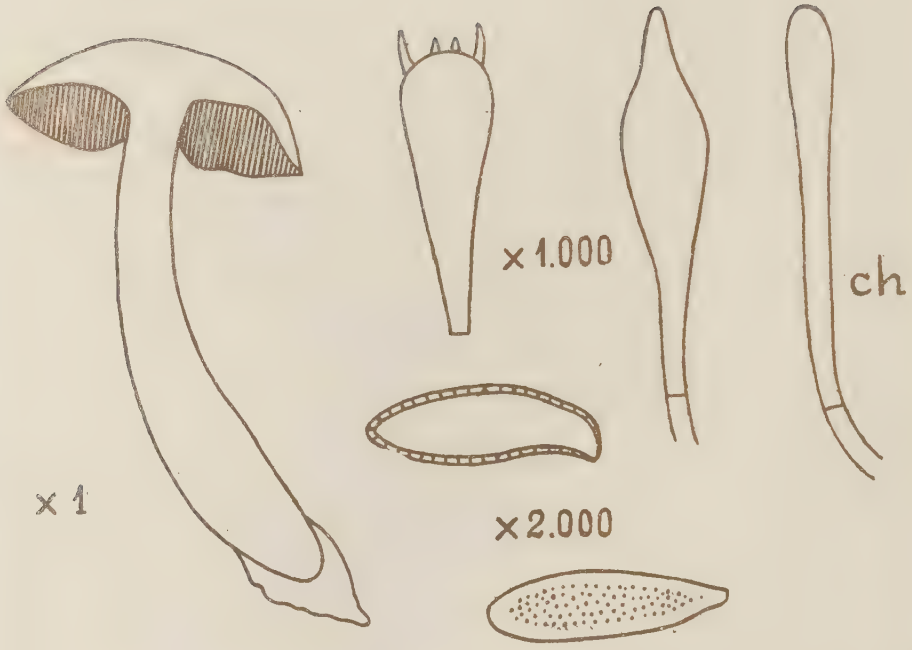

Fig. 4-5

J.S.Caldas

Processo Multilith

IMUR, 25.4.1961